Leidy, Robert

From: Julia Fonseca <Julia.Fonseca@pima.gov>
Sent: Tuesday, March 25, 2014 3:07 PM
To: Goldmann, Elizabeth
Cc: Leidy, Robert
Subject: FW: ADEQ Basis for State 401 Certification Decision for Rosemont Copper Project
Attachments: patterson-annandale-2012.pdf

FYI, in response to your question.

From: Evan Canfield
Sent: Tuesday, March 25, 2014 2:36 PM
To: Julia Fonseca; Akitsu Kimoto
Subject: RE: ADEQ Basis for State 401 Certification Decision for Rosemont Copper Project

Hello Julia,

The Patterson and Annandale memo is a very high level evaluation with some arm-waving conclusions. They make the case that there is a bedrock-controlled pinch-point downstream of Hwy 83, and note that sediment deposits upstream of this. However, they also note that … *Streams such as these have extremely high sediment transport rates (for example, Reid, et al., 1998 and Greenbaum and Bergman 2006).* Then they go on to conclude that … *Barrel Creek is a classic example of a sediment-transport limited system.* How can both statements be true? I suspect it is because *Reid, et al., 1998 and Greenbaum and Bergman 2006* actually measured it.

My point would be that their photos and observations do not tell the whole story. We live in basin and range where sediment from the mountain has created deep valley fill. The fact that Patterson and Annandale have identified some places where grade controls maintain channel elevation does not negate the big picture. These streams do have high sediment transport rates even if they are rock lined. Watersheds are steep with limited cover, and there is a lot of sediment supply (Langbein –Shumm curve has us some of the highest in the world). Sediment is transported in suspension as well as bed load, and by looking at the stream bed they are claiming to understand sediment dynamics as a whole. Significant volumes of suspended sediment could be easily carried beyond this pinch point.

They continue to build on the idea that impact of the mine is proportional to the catchment area and cite previous Rosemont Reports (they note that the mine is only 13% of watershed) without looking at the sediment supply potential differences across the watershed. I believe removing sediment supply from Barrel Canyon will have a proportionally greater impact, because the mine site is steeper and gets more rainfall than the portion further down.

I think comments c and d from our previous letters are still valid:

c. The impacts of mining activities on sediment transport could change over time during the active mine life and after the closure. The FEIS reported that the reach of Davidson Canyon is currently a sediment transport-limited system. However, with a reduction in sediment load from the project area over time, it is

possible that loose sediment is washed out and as a result the sediment transport system could be changed. The changes in sediment balance could affect the fluvial geomorphology of the Davidson Canyon and Cienega Creek. Appropriate sediment transport analysis is necessary to estimate long-term impacts of mining activities on channel geomorphology, vegetation and fluvial system of the "Potential Waters of the United States". Cumulative impacts of possible changes in sediment transport system on "Potential Waters of the United States" over time should be disclosed. County PAFEIS comments, p. 78.

d. The FEIS acknowledged that there will be a reduction in sediment yield from Barrel Canyon watershed but no change in the geomorphology of the channel is expected. The FEIS only discusses about annual average sediment delivery. The FEIS did not consider cumulative impacts of sediment delivery change over the active mine period and post-closure. Considering the proposed active mine life is over 20 years, the FEIS should assess long term impacts on sediment yield, delivery and channel geomorphology. County PAFEIS comments, p. 79.

Evan

From: Julia Fonseca
Sent: Tuesday, March 25, 2014 11:08 AM
To: Evan Canfield; Akitsu Kimoto
Subject: FW: ADEQ Basis for State 401 Certification Decision for Rosemont Copper Project
Importance: High

Evan/Akitsu, please comment on the assumption that fill activities in Barrel and tribs will not affect geomorphology downstream. I take it from your objections that you would say that the information is not available to make that determination?

And their assumption that the grade controls mentioned below would limit downstream erosion in the OAW reach? How can that be?